

Fig. 1A

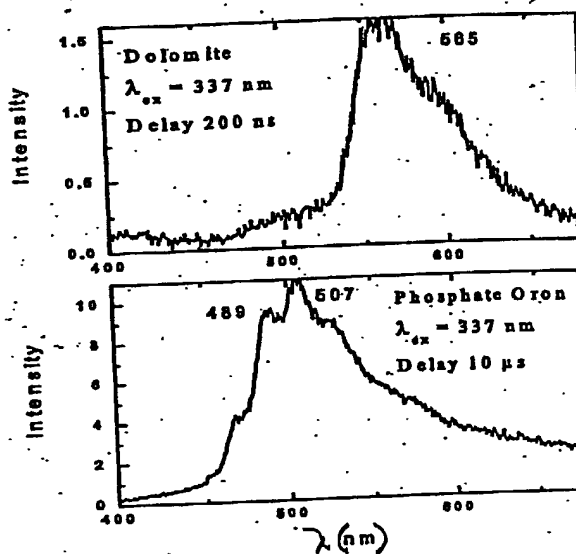
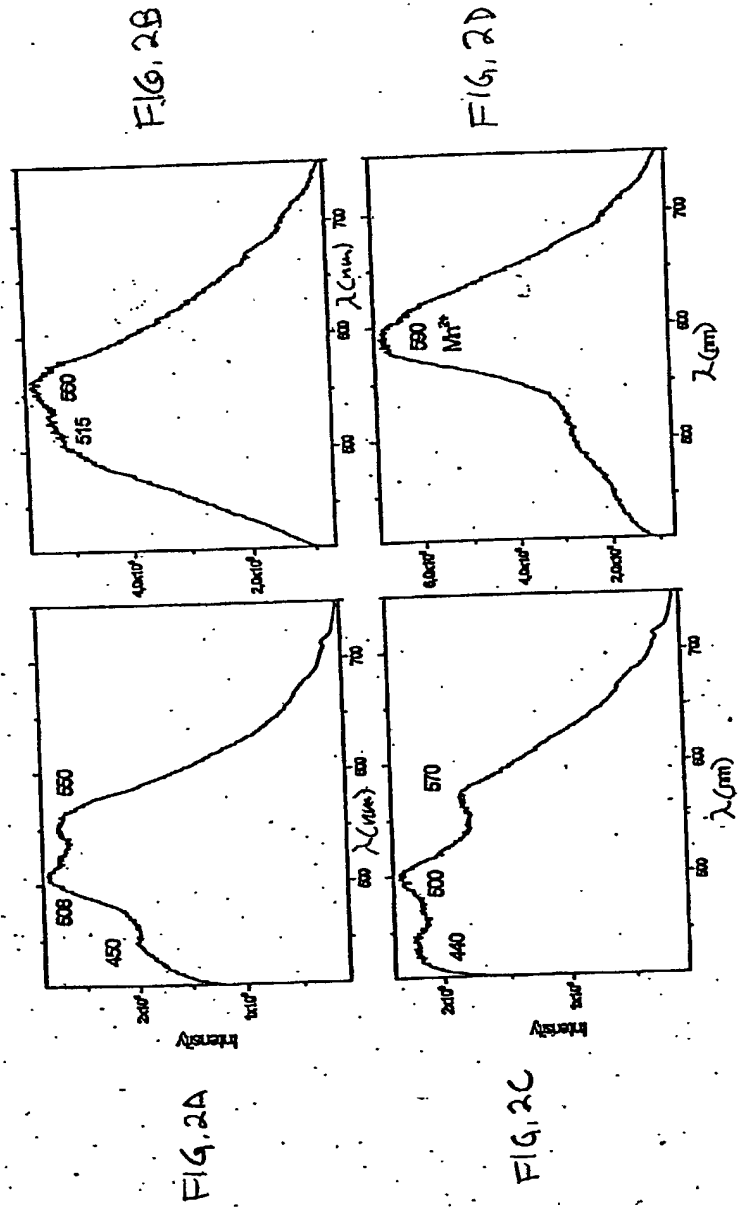
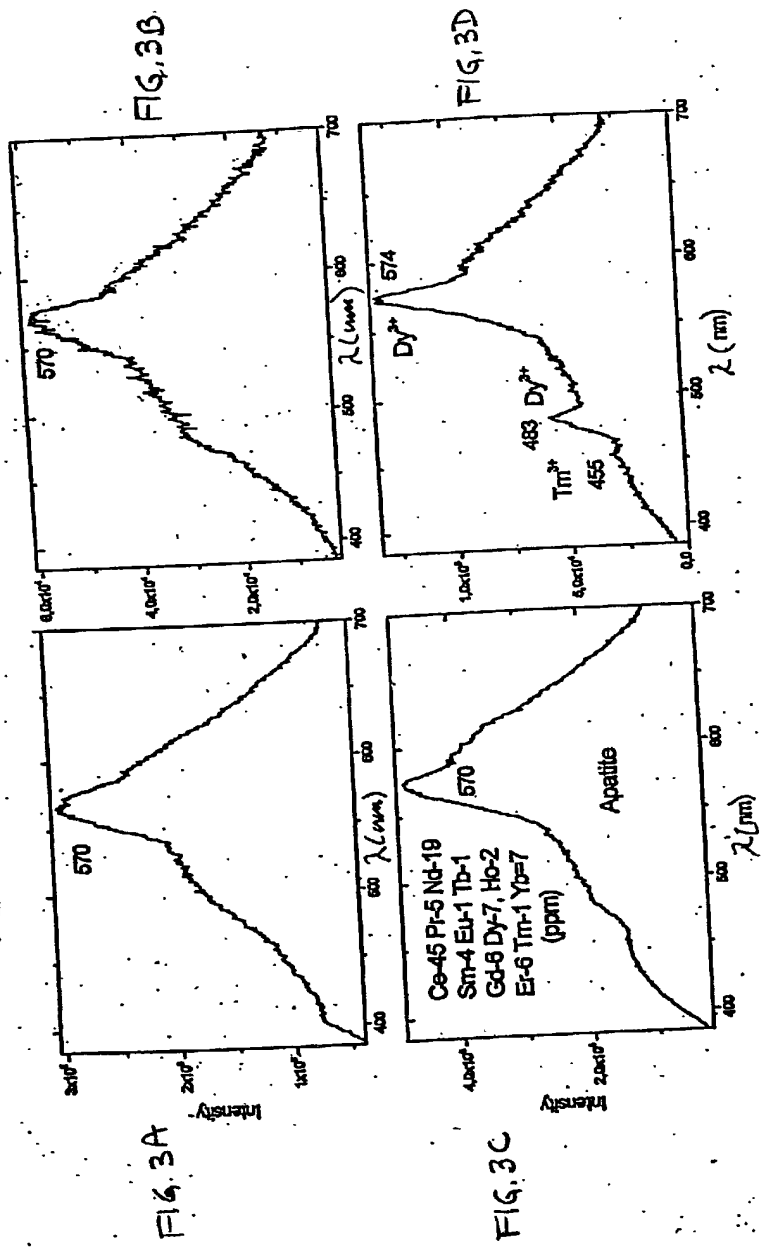
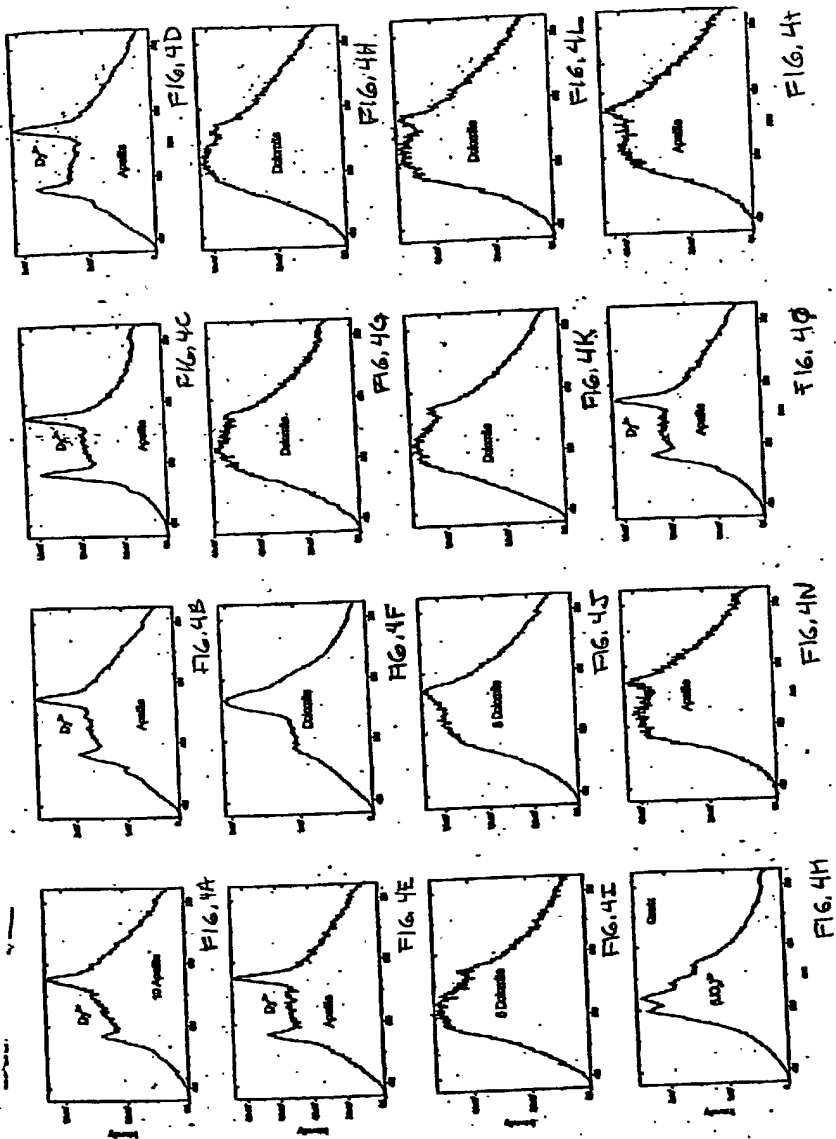
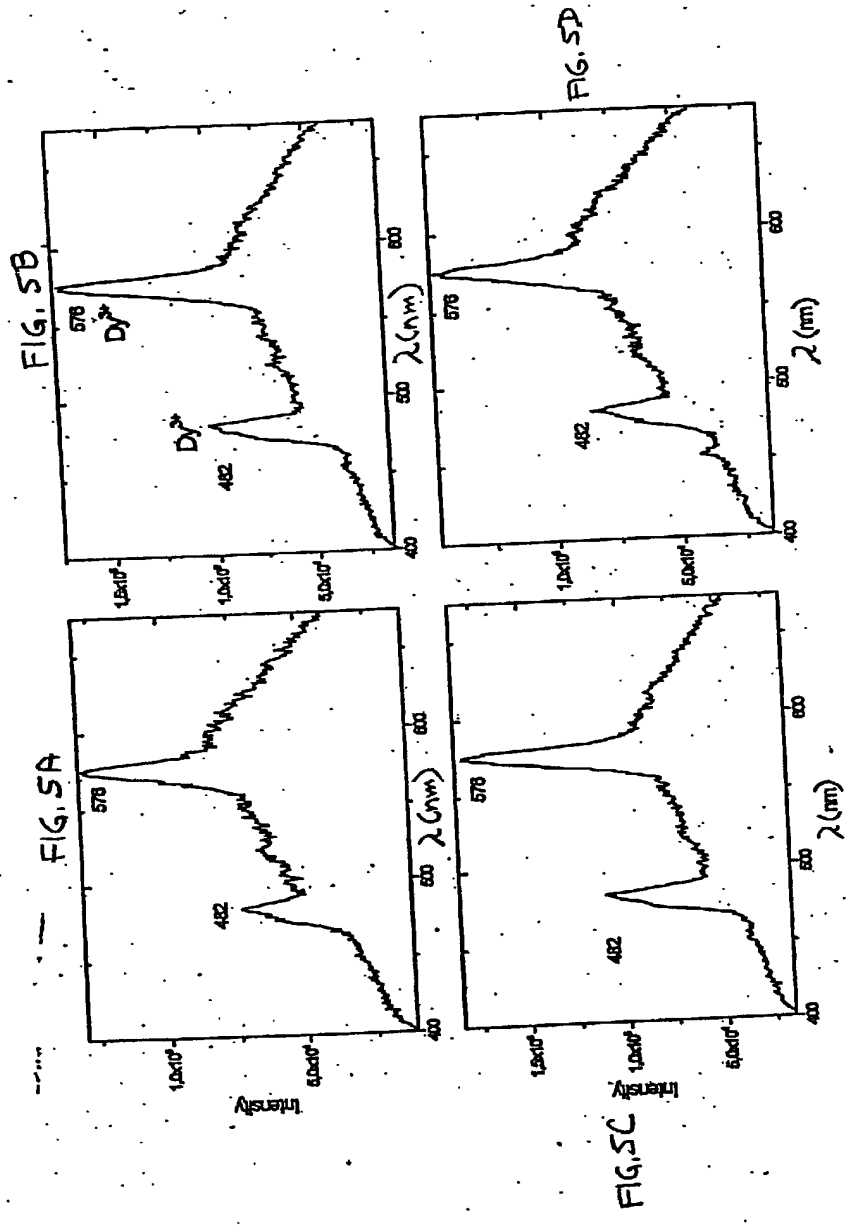


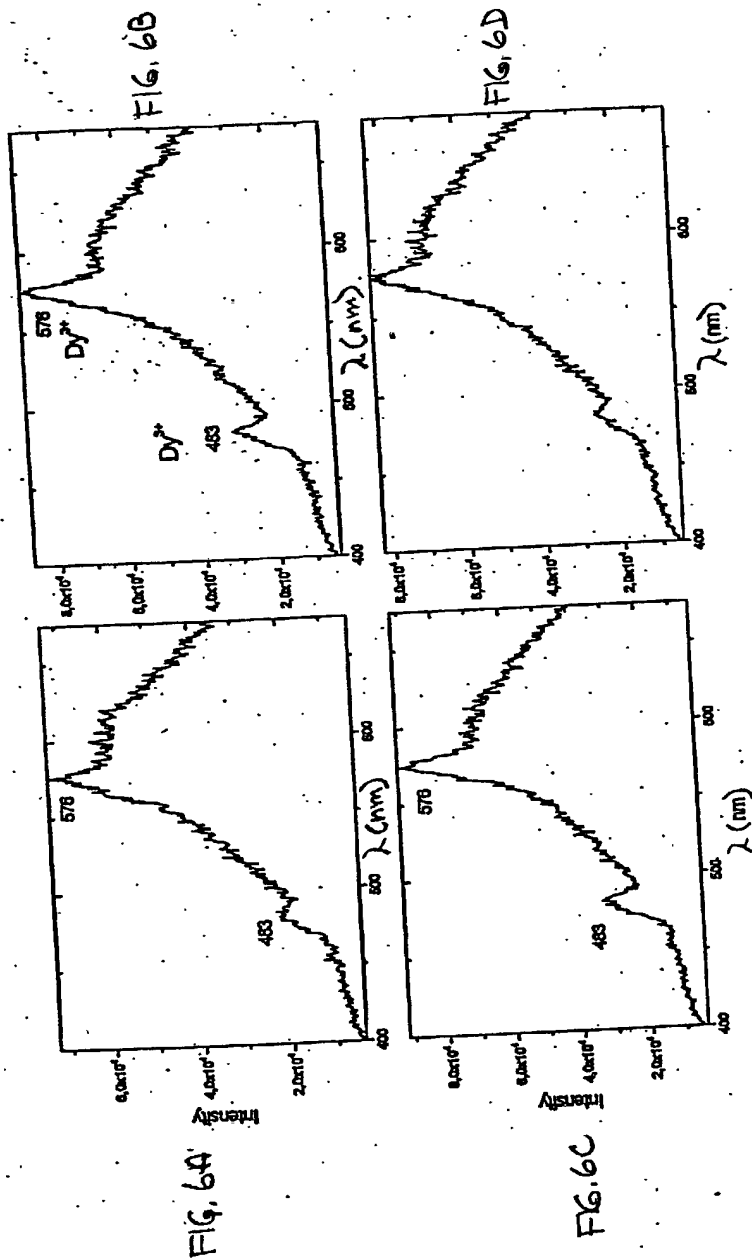
FIG. 1B











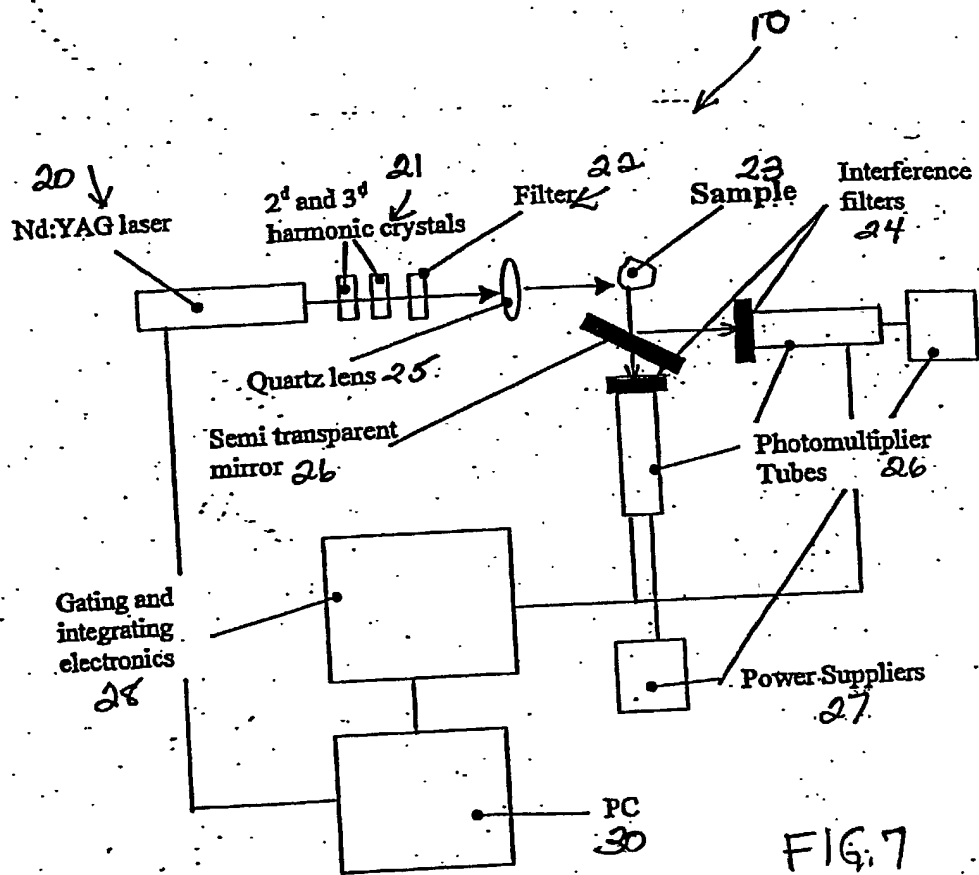


Figure 1 is a plot of Intensity (a.u.) versus Wavelength (nm). The x-axis ranges from 440 to 600 nm, with a break between 500 and 550 nm. The y-axis ranges from 0 to 1000 a.u. The plot shows two peaks: a main peak at approximately 475 nm and a secondary peak at approximately 570 nm. The intensity scale ranges from 0 to 1000 a.u., and the wavelength scale ranges from 440 to 600 nm, with a break between 500 and 550 nm.



FIG. 9B

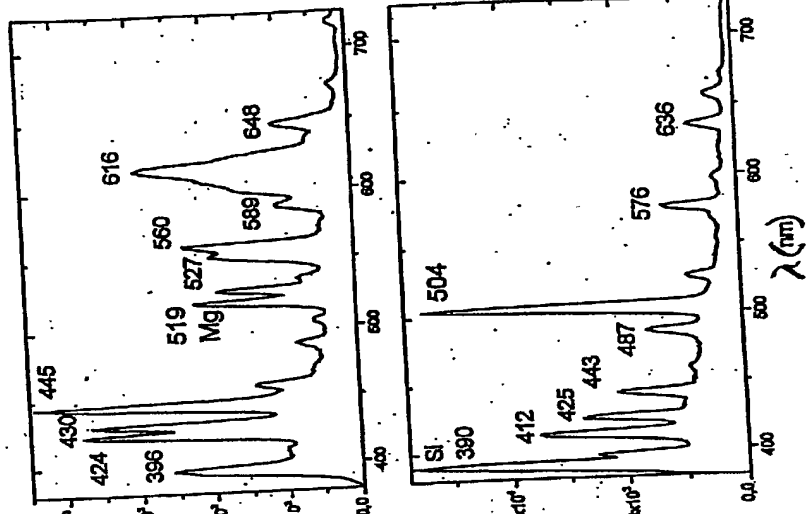
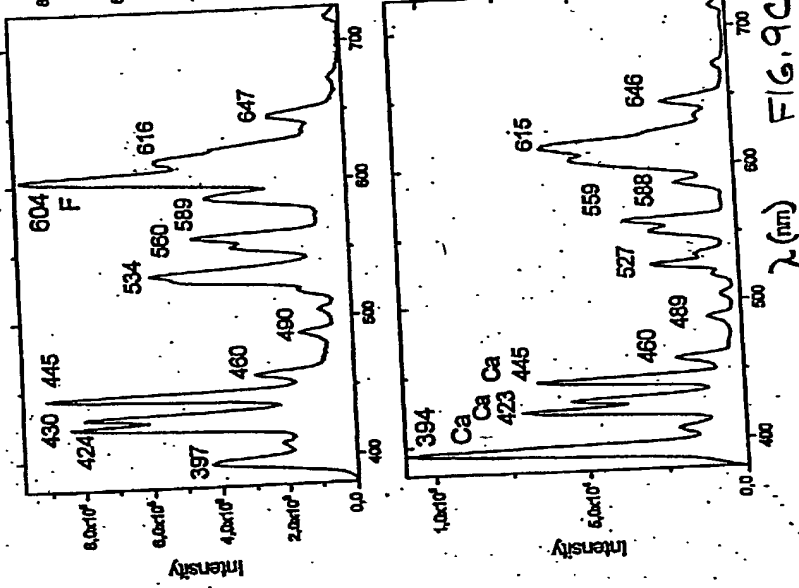
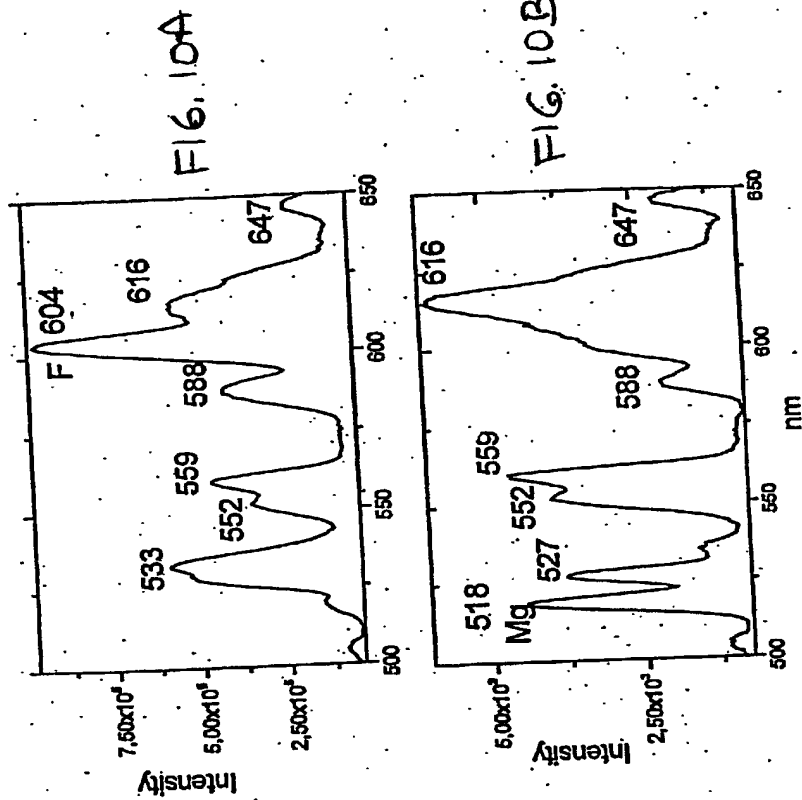


FIG. 9A





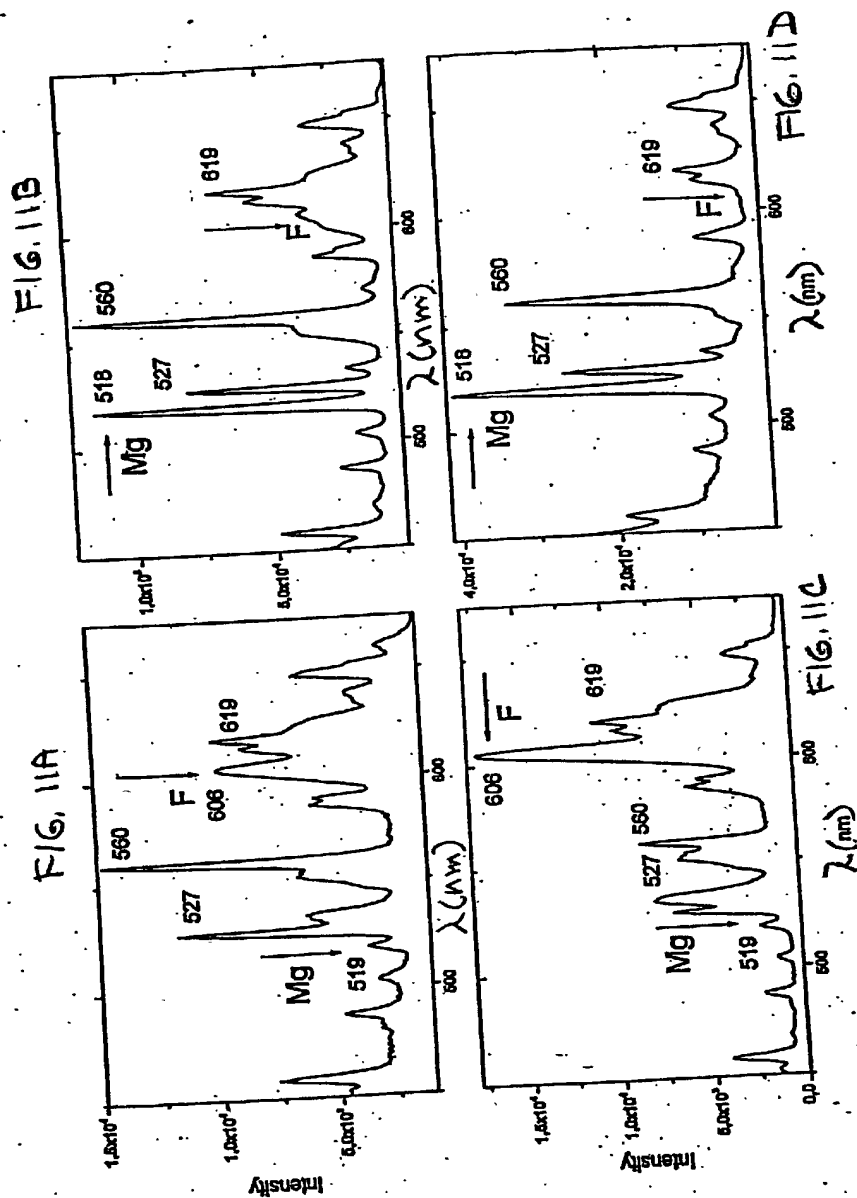


FIG. 12B

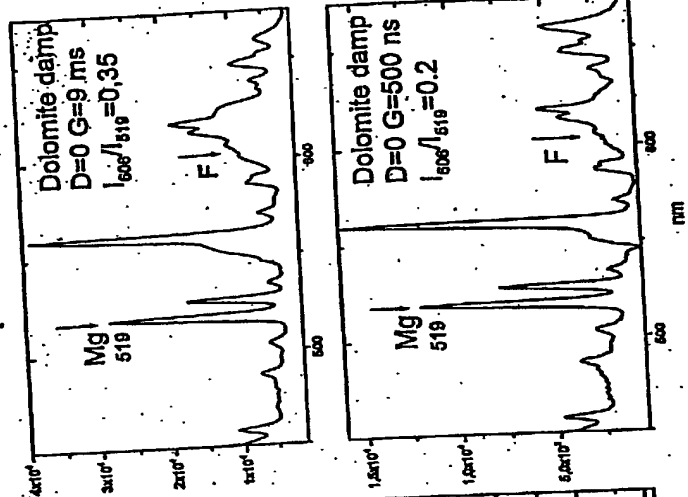


FIG. 12D

FIG. 12A

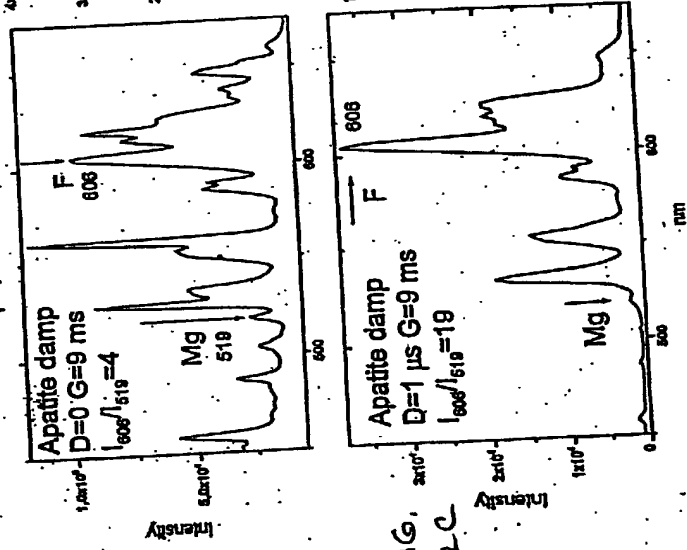


FIG. 12C

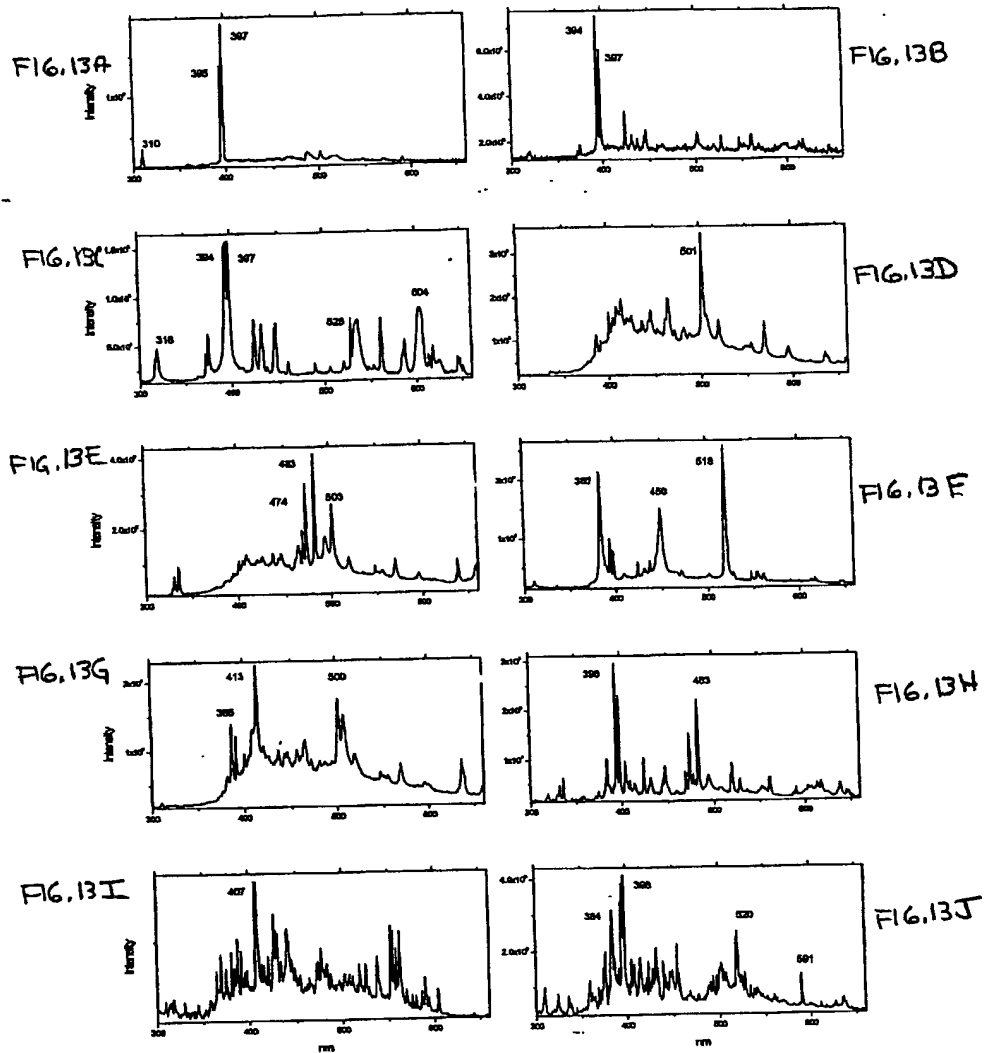


FIG. 14

<b>Table 1</b> <b>Rare-Earth Element Concentration in Florida Apatite</b> <b>Determined by Inductively Coupled Plasma Method (ICP)</b>													
REE	Ce	Pr	Nd	SM	Eu	Tb	Gd	Dy	Ho	Er	Tm	Er	Yb
Ppm	45	4.5	19	4	1.2	1.0	6	7	1.7	5.6	0.9	5.6	6.8

FIG. 15

Table 2(a). $I_{580}/I_{530}$ Distinguishing Features in Apatite and Dolomite Under 337 and 355 nm Excitation						
Sampling	Color	Apatite %	Apatite with $I_{580}/I_{530}$ %	Dolomite	Dolomite with $I_{580}/I_{530}$ %	Apatite without $I_{580}/I_{530}$ %
+ 1/2	white	41	67	59	0	33
	black	100		0		
+ 3/8	white	52	80	48	7	20
	black	83		17		
+ .156	white	63	80	37	0	20
	black	92		8		
+ 16	white	92	84	8	0	16
	black	100		0		
Kingsford	white	70	81	30	0	19
	black	100		0		
Fort Green	white	83	87	17	0	13
	black	92	9	8		

FIG. 16

Table 2(b). Dy <sup>3+</sup> Distinguishing Features in Apatite and Dolomite Under 337 and 355 nm Excitation						
Sampling	Color	Apatite %	Apatite with Dy3+ %	Dolomite	Dolomite with Dy3+ %	Apatite without Dy3+ %
+ 1/2	white	41	67	59	0	33
	black	100		0		
+ 3/8	white	52	40	48	0	60
	black	83		17		
+ .156	white	63	80	37	0	20
	black	92		8		
+ 16	white	92	80	8	0	20
	black	100		0		
Kingsford	white	70	56	30	0	44
	black	100		0		
Fort Green	white	83	73	17	0	27
	black	92	9	8		



FIG. 17

Table 3. Chemical Analyses of the Products Received by LIBS									
	PITRLS	No. Pebbles	MgO	P <sub>2</sub> O <sub>5</sub>	BPL	F	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	Insoluble
1	"Bad"	20	2.21	3.48	7.60	0.37	1.11	2.23	70.40
	"Good"	31	0.46	28.61	62.52	3.58	0.74	1.08	12.94
2	"Bad"	18	2.50	5.93	12.96	0.52	1.06	3.84	63.92
	"Good"	33	0.44	28.11	61.42	3.33	0.78	0.75	13.33
3	"Bad"	13	4.6	4.49	9.81	0.3	1.27	2.01	56.46
	"Good"	45	0.34	27.37	59.80	3.42	0.76	1.42	14.24

FIG. 18

Table 4 shows LIBS analysis of the same samples.

Table 4. LIBS Data Using PMP Setup					
Sample		I <sub>600</sub>	I <sub>520</sub>	I <sub>600</sub> /I <sub>520</sub>	Mineral
1/2	4	18.2	4.8	3.8	Apatite
1/2	5	6.4	3.2	2	Dolomite
1/2	6	11.6	6.6	1.8	Dolomite
1/2	7	15.6	2.1	7.8	Apatite
1/2	8	8.8	4.2	2.1	Dolomite
1/2	9	14.4	9	1.6	Dolomite
1/2	10	25	4.4	5.7	Apatite
1/2	12	10.6	1.7	6.2	Apatite
1/2	13	15.6	2.1	7.8	Apatite
1/2	14	11	2.5	4.4	Apatite
1/2	15	1.8	0.8	2.3	Apatite
3/8	9	7	4.6	1.5	Dolomite
3/8	10	19.4	3	6.5	Apatite
3/8	11	4.2	4.2	1	Dolomite
3/8	13	4.6	2.3	2	Dolomite
3/8	15	7.5	1.2	6.2	Apatite
3/8	16	11.4	1.4	8.1	Apatite
3/8	17	16	2.2	7.3	Apatite
3/8	18	19	3.6	5.3	Apatite
3/8	19	18	2.4	7.5	Apatite
3/8	20	13	1.6	8.1	Apatite